

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of:)	
)	
Amendment of the Commission's Rules with)	GN Docket No. 12-354
Regard to Commercial Operations in the 3550-)	
3650 MHz Band)	

COMMENTS OF ENTELEC

The Regulatory and Technology Committee of ENTELEC respectfully submits these Comments in response to the Commission's Further Notice of Proposed Rulemaking ("FNPRM") in the above captioned proceeding seeking further comment on a proposed Revised Framework for the 3550-3650 MHz (3.5 GHz) band.¹ Critical infrastructure entities, which include ENTELEC members, urgently require this spectrum to fill a void in affordable licensed broadband spectrum for critical systems. ENTELEC urges the Commission to recognize that for this band to be effectively utilized by the Oil, Gas, and Energy Utilities (collectively the OG&E) industries, **Priority Access License ("PAL") access** (emphasis added) in accordance with the ENTELEC recommendations detailed herein is critical.

ENTELEC (the Energy Telecommunications and Electrical Association) is a user association focusing on communications and control technologies used by petroleum, natural gas, pipeline and electric utility companies. Our response to the FNPRM is centered on the Commission's structure for the CBRS licensing framework as it pertains to the needs of users within the OG&E industries.

I. INTRODUCTION

¹ See *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, Further Notice of Proposed Rulemaking*, GN Docket No. 12-354 (Apr. 23, 2014) ("FNPRM").

On December 12, 2012 the Commission issued a Notice of Proposed Rulemaking ("NPRM" proposing the creation of a new Citizens Broadband Radio Service ("CBRS") sharing the 3550-3650 MHz band with incumbent users.² The Commission held a workshop on March 14, 2013 to bring together diverse perspectives on the band and foster productive discussion on the NPRM.³ On November 1, 2013 the Commission issued a Public Notice to that elaborated upon some of the licensing concepts and alternatives set forth in the NPRM.⁴ On April 23, 2014 the Commission issued a Further Notice of Proposed Rulemaking, seeking further comments, with a structure involving (but not limited to) per census tract allocations, three tiers of access license (Incumbent, Priority, and General), expanded licensee eligibility for the priority tier, auction applicability, license terms of a relatively short duration, a Spectrum Access System to implement a dynamic allocation structure, and an eventual assimilation of the existing 3.65-3.70 GHz band into the CBRS. ENTELEC is very concerned with all of these structure proposals, and will address our concerns as well as other detailed recommendations of how to resolve.

II. COMMENTS

First and foremost, ENTELEC and the OG&E industries it represents strongly support the prospect of having access to additional spectrum resources in the 3.5 GHz range to help enable their operations. OG&E entities are constantly adding software applications and an increasing number of compliance activities that are driving their need for Radio Frequency ("RF") bandwidth. OG&E is always seeking broadband (3 MHz or greater) channel bandwidths to facilitate enough RF capacity that can help provide for these ever increasing needs. These include much needed bandwidth for the transmission of

² See Notice of Proposed Rulemaking, *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, 27 FCC Rcd 15594 (2012)

³ See Wireless Telecommunications Bureau And Office of Engineering and Technology Announce Workshop on Small Cell and Spectrum Sharing Concepts in the 3.5 GHz NPRM, GN Docket No. 12-354, *Public Notice*, 28 FCC Rcd 442 (2013).

⁴ See Licensing Public Notice "Commission Seeks Comment on Licensing Models and Technical Requirements in the 3550-3650 MHz Band", released Nov. 1, 2013.

Supervisory Control and Data Acquisition ("SCADA"), secure Intranet and Internet data, and critical process control data.

Unfortunately, most legacy spectrum allocations available without auction are limited to narrow bandwidths that only support traditional "serial" connected devices, versus the new trend for all-IP based connectivity. To alleviate this, the OG&E industries have utilized wide bandwidth unlicensed spectrum and the existing hybrid-licensed 3.65 GHz band. However, the nature of unlicensed spectrum can be unpredictable as operations within populous areas are many times unreliable due to the large number of devices, especially in the 2.4 and 5.8 GHz bands. Congestion on the unlicensed bands has forced OG&E industries to "layer" a number of systems on various frequency bands (including 900 MHz and 3.65 GHz) in the same location in order to aggregate enough bandwidth to support multiple applications. Further, congestion on the available spectrums in many areas has increased to a point where system link budgets will no longer support the required data bandwidth, especially when the RF channel sizes are greater than a few MHz.

ENTELEC therefore welcomes the opportunity to comment on the proposed regulatory framework of this FNPRM, especially in the area of priority user access and a simplification of the framework, in order to make the spectrum more viable for OG&E entities. We feel that the spirit of the CBRS is to build on the successes the current 3.65 GHz band, whose success is highly tied to its acceptance by enterprise users of the spectrum. The following details our recommendations to the Commission.

- 1) Priority Access License Eligibility. The current FNPRM broadly defines PAL eligibility to include a number of entities including large commercial carriers. This is a complete turnaround to the original NPRM which afforded PAL eligibility to supply dedicated broadband spectrum for private, mission critical operations, such as commonly found in the OG&E industries. ENTELEC

urges that eligibility for a PAL should be limited to critical infrastructure (CI) users in census tracts which fall in Metropolitan Statistical Areas ("MSA"). In rural areas outside of an MSA, the definition can be expanded to the current eligibility proposed.

For the purposes of this designation within MSAs, CI should be defined as OG&E, Municipal services, Utility services, and any FCC sanctioned experimental or non-profit service. The basis of this is that for this band to truly remain for citizens, it should remain primarily for those enterprises that do not generate revenue through spectrum resources, but merely use spectrum resources to facilitate safe and effective operations. Furthermore, inside of MSA areas, OG&E entities are in tight competition for existing unlicensed spectrum resources and cannot compete in auctions for licensed spectrum that is used to generate revenue by commercial wireless service providers. In addition, there are large numbers of interference issues with which to contend. By restricting MSA access to CI users, this would truly meet mandates for added spectrum relief by providing frequencies with interference protection.

- 2) Frequency Assignments, the Spectrum Access System ("SAS"), and Channel Bandwidth. There are many challenges to "re-farming" radio spectrum such that incumbents are not unjustly discriminated. The OG&E industry knows this very well as many systems in the former 2 GHz microwave band were moved to allow for expansion of spectrum afforded to wireless operators.

While we understand that the Commission would like to utilize a Spectrum Access System to administer frequencies dynamically, ENTELEC argues that the use of this system will detract from the use of this band, similar to why the use of the "TV Whitespace" band has been limited. For example, OG&E entities frequently operate stand-alone systems that are not connected to

the internet. Further, internet connectivity is not an option or convenient in many remote areas. Thus, it may be impossible or impracticable to meet the SAS connectivity requirement. Even if the requirement can be facilitated, it would add cost, complexity, and IT security concerns that may render the band ineffective for many use cases, especially when you consider that OG&E entities do not generate revenue directly from the use of spectrum. To these points, ENTELEC does not support the use of an SAS in this band.

ENTELEC would therefore support fixed allocation scheme(s) that are able to balance any exclusion zones or satellite earth station incumbent issues. One example scheme based on the spirit of the Commission's recommendations including the 50/50 access between the Priority Access ("PA") and General Authorized Access ("GAA") users is as follows:

BW	10	10	10	10	10	10	10	10	5	5	5	5
FI (MHz)	3550	3560	3570	3580	3590	3600	3610	3620	3630	3635	3640	3645
Fu (MHz)	3560	3570	3580	3590	3600	3610	3620	3630	3635	3640	3645	3650
CH #	1	2	3	4	5	6	7	8	9	10	11	12
User	PAL	PAL	PAL	PAL	GAA	GAA	GAA	GAA	PAL	PAL	GAA	GAA

ENTELEC recommends an allocation of four 10 MHz channels and two 5 MHz channels to both PAL and GAA tiers, rather than the Commission's exclusive use of 10 MHz channels. We argue that allowing both 5 MHz and 10 MHz channels provides for more flexibility in dealing with different system requirements and exclusion zones, as well as option to look into potential Frequency Division Duplex ("FDD") possibilities, allowing users to pair channels 9 and 10 with channel 4, for example. Channel 4 could also be segmented into separate 5 MHz channels.

We also recommend that a future channel plan for the 3.65-3.70 GHz band should be

considered in terms of both 5 and 10 MHz channel sizes in the event it is absorbed into the CBRS. Allocating the current 3.650-3.675 GHz restricted band using only 5 MHz blocks can also be considered in order to support our proposed solution in section 11c).

- 3) Exclusion Areas. ENTELEC recognizes that the Commission is concerned that a fixed band frequency allocation scheme would not be as efficient as a dynamically assigned method due to a large amount of exclusion area, which may affect GAA or PAL allocations disproportionately. As Commissioner O’Rielly stated, “the 3.5 GHz Band would be largely unusable on the east and west coasts and along the Gulf.” If by rule, much of the country is not included in the CBRS band, this will reduce the usefulness of this band for OG&E users. Therefore, the FNPRM has proposed the SAS as a solution. However, as stated in the above section 2, we do not support the SAS as we feel that the internet connectivity required to implement a dynamic system is impractical and will limit the success of the band for OG&E users.

To resolve this, we recommend the Commission both reduce the size of the exclusion zone areas and create a finite number of fixed band plans like the one suggested in section 2 of this response, and then assign particular band plans on a per census tract basis that makes sense when you take into account the reduced exclusion zone area. We believe that this can be done in the vast majority of census tracts with only a few (two or three) plans.

- 4) PAL/GAA Spectrum Balance. We support the proposed idea of a 50/50 split between PAL and GAA spectrum allocations in the 3.55-3.65 GHz band. Note that should the 3.65-3.70 GHz band be assimilated into the CBRS service, we urge that it should be dedicated as a GAA band after the grandfathering period is complete. At that time, the Commission should consider the success up to that point of the PAL spectrum to decide if a continued 50/50 system is warranted

in consideration of the added 50 MHz of GAA spectrum.

- 5) Geographical licensing. The use of licensing by census tracts is new in terms of licensing and we support this regimen. Of course, an alternative would be to license the band on a point/radius method, but that would require the use of a frequency coordinator to manage license areas. One advantage of the point/radius method would be that large census tracts would be able to support many more PALs at the expense of more complex border system interference limits. In the end, we feel the GAA tier affords many opportunities to small deployments and we are willing to support a per census tract license scheme that is less complex.

We noticed that the Commission did not address the Gulf of Mexico, an area outside of the 50-states and their census tracts, but within the Commission's jurisdiction. We propose that licenses in this region be segmented the same way as in BRS auction 86, in three areas that in combination form Economic Area ("EA") 176.

- 6) PAL Fees. The idea of a competitive auction for licenses when multiple applications are filed would greatly disadvantage users who do not generate direct revenue from their use of spectrum. Furthermore, auctions on a per census tract basis are cumbersome and open up many other questions that would need to be answered based on the FNPRM. Therefore, the Commission should adopt a simple and reasonable fee structure for a PAL application, a PAL initial authorization, a PAL renewal, and a Contained Access License which uses a PA allocation. Fees should be in line with fees currently paid for Part 101 or Part 90 services.

- 7) Licensing Terms - PAL. It is in the public interest to prevent PAL's in the CBRS from being acquired by speculators, who look at appreciation of the license value versus construction of a system to be their primary intention. In addition, the idea of a competitive auction for licenses when multiple applications are filed would put users who do not generate direct revenue from their use of spectrum at a disadvantage. This is the case for CI entities. Thus, ENTELEC does not support the idea of auctions and supports a process where a PAL applicant will include general information on the type of system being planned for the license area. A PAL can then be granted to the applicant on an initial 2-year basis, subject to a build-out requirement based on their application.
- 8) Lottery for Multiple PAL Applicants. A simple lottery-based system should be implemented in the event two or more applicants file applications on the same day and request the same PAL frequency block. In the event that two or more entities apply for a license while other spectrum blocks are available, we urge the Commission to freeze those potential licenses, giving those applicants ten (10) business days (or some reasonable "freeze period" of time) to reach a mutual agreement on each application and to provide notification to the FCC. Otherwise, the FCC will conduct a lottery and award the winner the spectrum while denying the other application(s). The Commission can accept an application during the freeze period, but it cannot act on it until the original applications are acted upon.
- 9) PAL Renewals. Subjecting PAL's to a competitive process which does not guarantee their ability to retain a license, even when they remain "upstanding," creates a harsh situation that puts at risk the equipment investment of the licensee. This will reduce the great potential of this spectrum from making an impact.

ENTELEC proposes that the Commission guarantees the licensee renewal provided the system remains in bona fide operations. At the end of their initial 2-year term, the PA licensee will need to show that a radio system, serving the needs as outlined in their original application, was constructed and is in operation. Provided this is met, the licensee could renew the PAL for a term of 5-years at a fixed renewal fee. Any subsequent renewal would also require continual operation of the system, and would also be for a 5-year term. Note that applicants can indicate a progressive build-out over time, but would need to show bona-fide usage and progress to be guaranteed renewal.

- 10) Licensing Terms - GAA. We agree that licensing for the GAA tier should be minimal as stated in the FNPRM. We do, however, support a simple licensing requirement for the CBRS GAA tier, somewhat similar to that used at the current 3.65 GHz band.

Our proposed licensing requirement would involve an operator authorization, and a notification to the FCC that a station is in operation on a per census tract basis. This station notification, coupled with a general operation license, would help a GAA users collaborate with one another in terms of mitigating interference on a voluntary basis. This spirit of cooperation is already in place in the 3.65 band and is facilitated with the licensing procedure, and we believe it is in the public interest to facilitate its continuation. This method will also make any assimilation of the existing 3.65 spectrum into the rules for CBRS much more seamless.

- 11) Existing 3.65-3.70 GHz Transition. In order to simplify licensing and FCC overhead, we recommend combining the 3.55 to 3.65 GHz band with the 3.65-3.70 GHz band in terms of

licensing. If the GAA licensing within the 3.55 to 3.65 GHz spectrum is initiated as described in section 10 of this response, it is a seamless transition for operators in the 3.65-3.70 GHz band to be moved as their licenses can be electronically converted by the FCC without added licensee effort. Furthermore, we propose two (2) additional measures:

- a) Elimination of the unrestricted protocol requirement. The 3.675-3.700 GHz band should no longer require the use of an unrestricted protocol, so that it falls in line with the CBRS GAA tier.
- b) 5-Year Equipment Grandfathering. Equipment certified under old rules that are used in this band will either require re-certification under the Citizen Bands Service Device (CBSD) rules within a 5-year window, or must be removed no later than the end of the 5-year window.
- c) Subdivision of Channel Sizes. While we feel it is important to set a minimum channel size of 5 MHz in each block, we know that there are legacy broadband applications that may only require a smaller spectrum. Thus we would support a CBRS rules in the GAA spectrum that supports legacy 1.75 MHz, 2.5 MHz, and/or 3.5 MHz operations in the 3.65-3.70 GHz band, provided such operations are contained within one (1) GAA channel (e.g. – the smaller channel in operation does not “bridge” 2 contiguous channels. However a user could aggregate two 2.5 MHz or two 1.75 MHz operations into a single 5 MHz channel).

- 12) Contained Access Facilities/License. The use of a Contained Access (“CA”) system is somewhat novel in terms of licensing. From an RF engineering standpoint, this amounts to supporting an “overlay/underlay” frequency licensing scheme, such that a CA system would utilize a low enough radiated power level inside of a structure to provide adequate service within the structure for devices to operate. Then the signal will degrade rapidly outside of the structure to where after a minimal distance that spectrum could effectively be re-used by another CA or PA

licensee much more often than if it were an "umbrella" of service over a larger area.

Based on the definitions we propose, a GAA entity would be able to operate a CA system by a simple operator license and notification to the commission. ENTELEC believes that there is nothing the Commission would need to do in this case, except to allow in its CBSD rules the system to use an internal contention based frequency allocation assignment method within the GAA blocks to mitigate possible interference issues.

However, obtaining a PA frequency block for a CA facility is another issue. Outside of an entity requesting PA spectrum to operate inside of a building by obtaining a PAL for the census tract, the question is do we support any expanded eligibility of a PAL for a separate Contained Access License ("CAL"), or whether the authorization of a CAL can be considered a separate authorization from a PAL within a location inside of the same census tract area and co-channel block of spectrum?

Yes, ENTELEC would support CALs on a per location basis within a MSA census tract only. We also would support an expanded PAL eligibility for the purposes of a CAL that would allow wireless operators and other non-CI users access to a CAL. Due to RF engineering concerns, we would strongly recommend as part of this support for a CAL, that a CA licensee must submit system RF details as part of its authorization. Furthermore, if a PAL is already issued for that census tract that would be co-channel with the proposed CAL, the PA licensee would have to grant consent. It is important to realize that PA licensee consent may not be possible where a PA licensee has implemented a remote metering or some other solution that may be just outside of the structure where the CA licensee proposes to operate. Much of this consent will

also revolve around the final Commission definition of what constitutes a CA facility.

We further recommend that after the proposed RF system details are submitted for a CAL to the existing PA licensee, a PA licensee would have 30 days to respond to a CAL request. We stress that requests for a CAL need to provide a minimum level of technical detail, including the predicted threshold outside the structure, in order to “start the clock.” No response by the PA licensee within the timeframe would be interpreted as consent.

Finally, the definition of the area which constitutes CA is subject to debate. From an RF perspective, industrial facilities such as refineries and power plants that appear to be outside of the CA definition act very much like buildings in some ways due to the many metal “overhangs,” while a high-rise CA office facility may have large windows that act more like outdoor areas with less RF containment. Also, the size of such CA deployments needs to be considered as large campus areas may be several square miles. Can a large theme park be a CA facility?

We propose a definition on a CA facility that includes both buildings and industrial complexes of less than 1 square mile where the signal level outside and above the contained area is lower than -95 dBm, or the PA licensee approves a higher level by consent. This consent shall extend to other PA licensees in the event the PAL changes hands. For larger facilities, multiple CALs could be obtained. It is important to reinforce that due to the PA licensee consent requirement, it may be impractical in an RF sense for a large CA facility to obtain PA licensee consent for a CAL authorization in areas where the PA licensee has very close operations. In such cases, it should be relatively easy in most cases for the CA facility to utilize GAA spectrum.

13) Effective Isotropically Radiated Power ("EIRP") Rules. The EIRP rules proposed by the

Commission address point-to-point and mobile rules. It allows for an EIRP of 30 dBm in non-rural and 47 dBm in rural areas. For point-to-point systems, the maximum EIRP is 53 dBm.

These numbers assume a 10 MHz bandwidth channel and they involve a mix of output power versus antenna gain to arrive at a maximum EIRP.

Our proposal supports 5 MHz channels as well as 10 MHz channels. Furthermore while channel sizes are one thing, a slightly narrower channel profile should be permitted for the GAA tier to operate under CBRD rules in order to enhance the link budget of a long range system. Based on this, we recommend that the EIRP limits for point-to-point systems in rural areas should be allowed to remain the same if a smaller bandwidth is employed (an increase of the power spectral density to 23 dBm/MHz for a 5 MHz channel). For urban areas given the many factors that exist, we agree to a reduced power level to maintain the same power spectral density.

14) Itinerant Traffic. The OG&E industries commonly use remote vessels and facilities that stay in place for several weeks or months, and then move to new locations. The industry considers these as itinerant vessels. Common examples are drilling rigs, lift-boats, and trailer offices that follow a project or operation. For the purposes of clarification, we ask that the Commission clearly associate that the use of the CBRS spectrum in a point-to-point application is consistent with itinerant operations, thereby affording this connectivity the higher EIRP limits.

15) Out-of-Band Emissions ("OOBE") Limits. The FNPRM seeks comments for the need of a -50 dBm/MHz versus a -40 dBm/MHz OOBE Limit. ENTELEC recommends that, even with the shared usage of various blocks of spectrum, the large natural attenuation at these frequencies will

permit effective operation at the less stringent OOBE limit (-40 dBm/MHz).

- 16) Receive Signal Strength ("RSS") Limits. The FNPRM proposes a -80 dBm limit at the border between licensees. This may be acceptable in environments with non –line-of-sight environments and large attenuation from trees and other "clutter." However, this level may be too strong in open or over-water applications (especially the Gulf of Mexico). Point –to –point applications also present more unique situations as well. Thus, a prescribed RSS limit of -80 dBm would be too strong in some areas and too weak in others for bordering systems in many cases.

Examples of this can be derived from considering that licensing is proposed on a census tract basis. Many small urban tracts could not support an isolated radio service as the proposed RSS level will limit the effective coverage area within that tract in order to establish a weak enough signal at the border. In other cases, neighboring systems surrounding a small tract at -80 dBm border levels may create too noisy an environment to be able to operate within that small tract (the proposed RSS limit is too low). In larger rural tracts, a -80 dBm interference level may also create too much noise (and the resulting SNR degradation). Since the average signal level for the user in a larger tract from a base station or point-to-point transmitter will be lower by virtue of larger distances, rural systems may not be able to achieve the high SNR requirements for modulation rates that afford maximal data rates, even with the added EIRP.

ENTELEC recommends that a solution to this is to simply require a Coordination Notice (CN) to be provided to PA licensees in adjacent census tracts where the signal level at the border is expected to be -95 dBm or greater in the prescribed channel bandwidth. Such measurement or

simulation can be made at 10' above the ground, as measured by a 0 dBi gain antenna, for systems using the 30 dBm/47 dBm EIRP limit. For systems using the higher point-to-point power levels, each path must be coordinated in the direction of the path with each PA licensee within any tract along the path for a distance of 25 miles from each endpoint. All CNs would have to denote the system type, base station antenna type, height, EIRP, and contain a predictive or measured signal contour at -95 dBm or some alternate coverage representation which delineates the RF conditions. CBRS Rules should state such CN shall be delivered to the licensee address no less than 10 days prior to operation, and require both PA licensees to work out any differences within 30 days of the system operation to their mutual satisfaction. After this time, any objections can be brought to the FCC for arbitration and/or resolution.

Letters of Agreement between adjacent PA licensees can serve to eliminate the CN requirement. Again, the FCC should foster the cooperation of licensees by allowing some flexibility while also presenting a framework that protects PA licensee's rights.

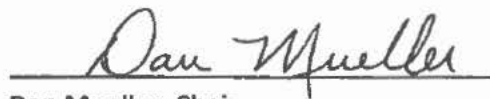
III. SUMMARY

As representatives of OG&E users, ENTELEC urges the Commission to expeditiously consider and adopt the above detailed recommendations. OG&E users urgently require this spectrum to fill a void in affordable licensed broadband spectrum for critical systems. We strongly believe that for the CBRS band to be effective in being utilized by the OG&E industry, PAL access is critical. Much of it extends from the wide experience with the uncertainties of unlicensed and pseudo-licensed spectrum. The licensing should be kept simple with a simple predictable fee structure that is affordable to OG&E users that do not generate direct revenue from the spectrum. PAL eligibility should be restricted within MSA areas to Critical Infrastructure users as defined in our response. License renewals should not be subject

to uncertainty provided the spectrum is being used and the licensee remains in compliance. Channel allocations should remain constant and not require dynamic adjustment that will increase network complexity and require connectivity to the internet which may or may not be available at a given location. Technical details in terms of bandwidth, bordering system cooperation, and the new Contained Access License must be done right to be successful. Integration of the existing 3.65 GHz band should be accommodated as much as practical by the CBRS rules in the GAA tier, and not be hampered by them.

We argue that these simple conditions are necessary in order to keep this spectrum from becoming an overly complex, competitively bid spectrum that will deter CI users such as OG&E, public safety, and others from obtaining PALs. Without these changes, OG&E users in many places will only be able to use this in the general access assignments, restricting this spectrum's ability to fulfill the spirit of the Presidential Memorandum and the bona fide needs in the OG&E industries – that of broadband licensed spectrum for mission critical RF systems meant to protect OG&E RF systems that facilitate modern, safe, and cost effective management of field operations in the 21st century.

Respectfully Submitted,

A handwritten signature in dark ink, appearing to read "Dan Mueller", is written over a horizontal line.

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